

CLAIMS

Claims 1-47 are canceled.

48. (Previously Presented) An expandable medical device comprising:
a plurality of elongated beams, the plurality of elongated beams joined together to
form a substantially cylindrical device which is expandable from a cylinder having a first
diameter to a cylinder having a second diameter, the plurality of the elongated beams
having a beam width in a circumferential direction; and

a plurality of hinges connecting the elongated beams having a hinge width, wherein the hinge width is smaller than the beam width, wherein the plurality of hinges each have a first end connected to a first of the elongated beams and a second end connected to a second of the elongated beams, the hinges being tapered from the first end to the second end.

49. (Previously Presented) The device of Claim 48, wherein the plurality of hinges taper substantially linearly.

50. (Previously Presented) The device of Claim 48, wherein each of the plurality of hinges includes a first portion extending along about 1/3 of the length of the hinge and a second portion extending about 2/3 of the length of the hinge, wherein the second portion is tapered.

51. (Previously Presented) The device of Claim 48, wherein during expansion the hinges experience deformation below their elastic limit.

52. (Previously Presented) The device of Claim 48, wherein deformation during expansion is confined to the hinge.

48 53. (Previously Presented) The device of Claim 48, wherein during expansion a structure adjacent the hinge experiences at least two degrees of freedom of motion.

112 54. (New) The device of Claim 48, wherein adjacent elongated beams form V-shapes when the cylinder is at the second diameter and wherein the plurality of hinges are each tapered such that an end of the ductile hinge closer to the apex of the V-shape formed by the adjacent elongated beams has a width which is greater than a width of the hinge at an opposite end. 48

55. (New) An expandable medical device comprising:
a plurality of elongated beams;
a plurality of hinges connecting the plurality of beams together in a substantially cylindrical medical device which is expandable from a cylinder having a first diameter to a cylinder having a second diameter, wherein the plurality of hinges are tapered with the hinge width, hinge length, and taper adjusted to achieve a desired value of the maximum strain along the hinge. 48 48

112 56. (New) The device of Claim 55, wherein the hinges are configured such that as the device is expanded from the first diameter to the second diameter the hinges experience plastic deformation while the beams are not plastically deformed. 48 48

48 57. (New) The device of Claim 55, wherein the taper is substantially constant along about 2/3 of a length of the hinges. 48

48 58. (New) The device of Claim 55, wherein the plurality of hinges taper substantially linearly. 48

59. (New) The device of Claim 55, wherein each of the plurality of hinges includes a first portion extending along about 1/3 of the length of the hinge and a second portion extending about 2/3 of the length of the hinge, wherein the second portion is tapered. 48

60. (New) The device of Claim 55, wherein during expansion the hinges experience deformation below their elastic limit. 49

61. (New) The device of Claim 55, wherein deformation during expansion is confined to the hinge. 50

62. (New) The device of Claim 55, wherein during expansion a structure adjacent the hinge experiences at least two degrees of freedom of motion. 51

63. (New) The device of Claim 55, wherein adjacent elongated beams form V-shapes when the cylinder is at the second diameter and wherein the plurality of hinges are each tapered such that an end of the ductile hinge closer to the apex of the V-shape formed by the adjacent elongated beams has a width which is greater than a width of the hinge at an opposite end. 52